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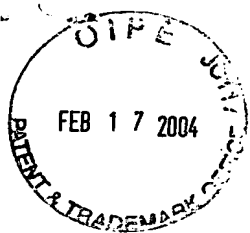
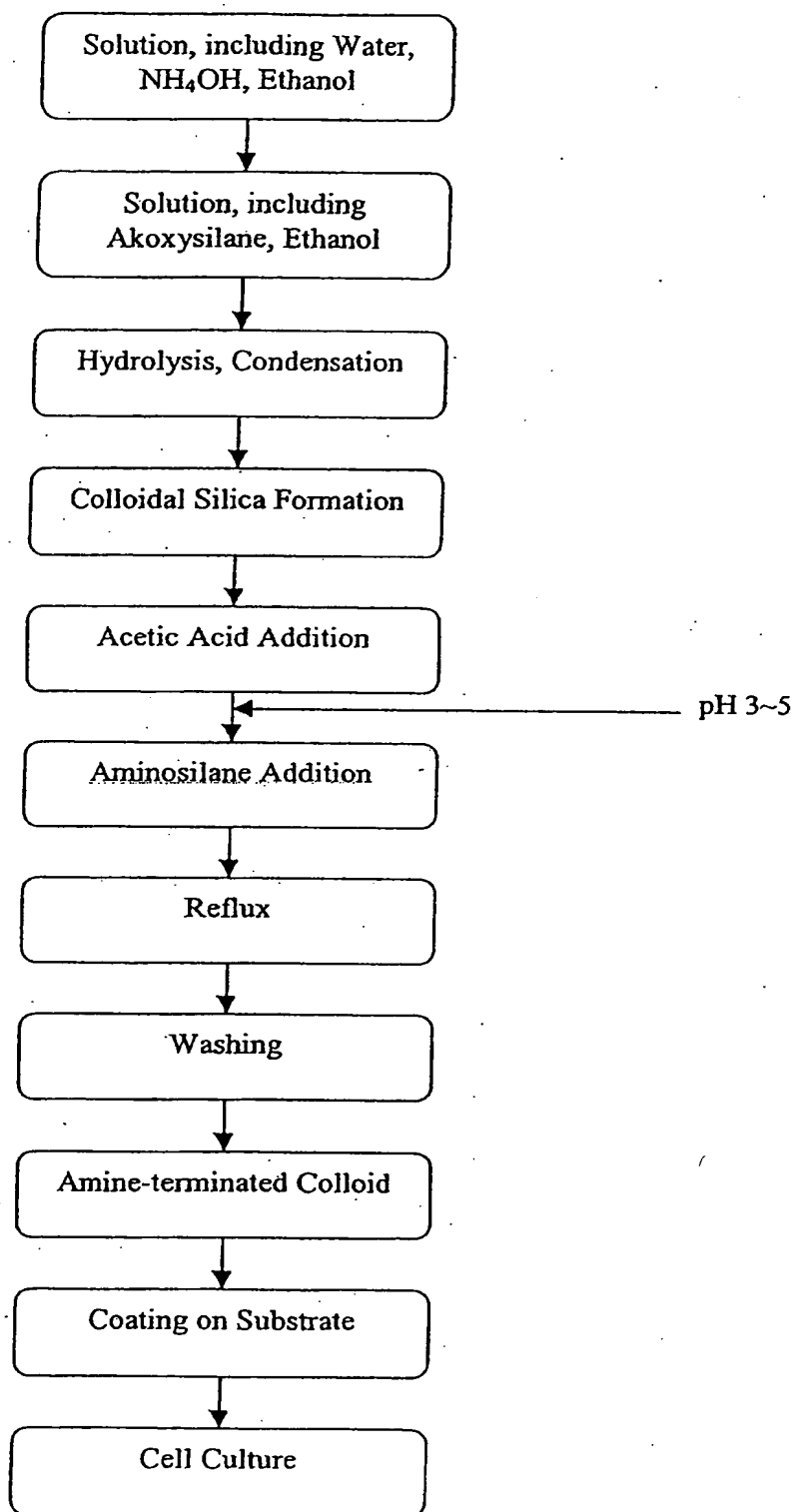
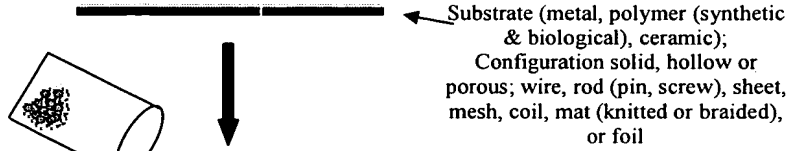


FIG. 1






**Step I**



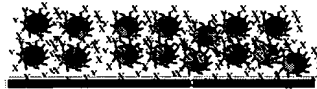
Substrate (metal, polymer (synthetic & biological), ceramic);  
Configuration solid, hollow or porous; wire, rod (pin, screw), sheet, mesh, coil, mat (knitted or braided), or foil

**Step II**

Spin coating, dip coating, atomizing (spraying)

 X = functional group, peptide, protein, oligo, avidin, biotin etc.  
Derivatized Particle

**Step III**



**Step IV: Repeat I - III with the same or different particle**

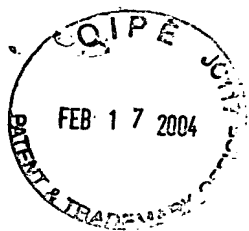
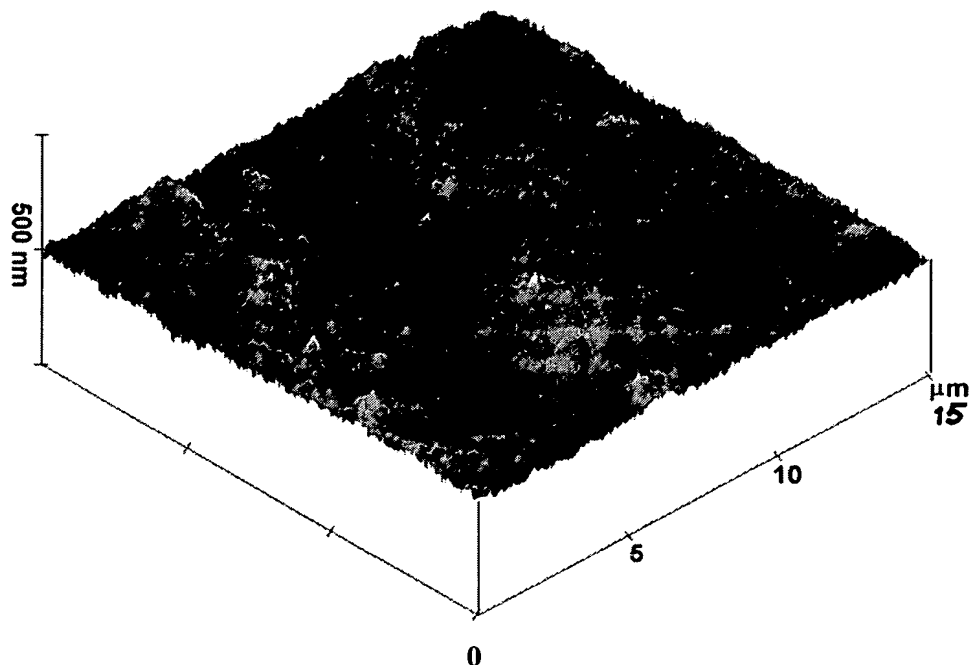
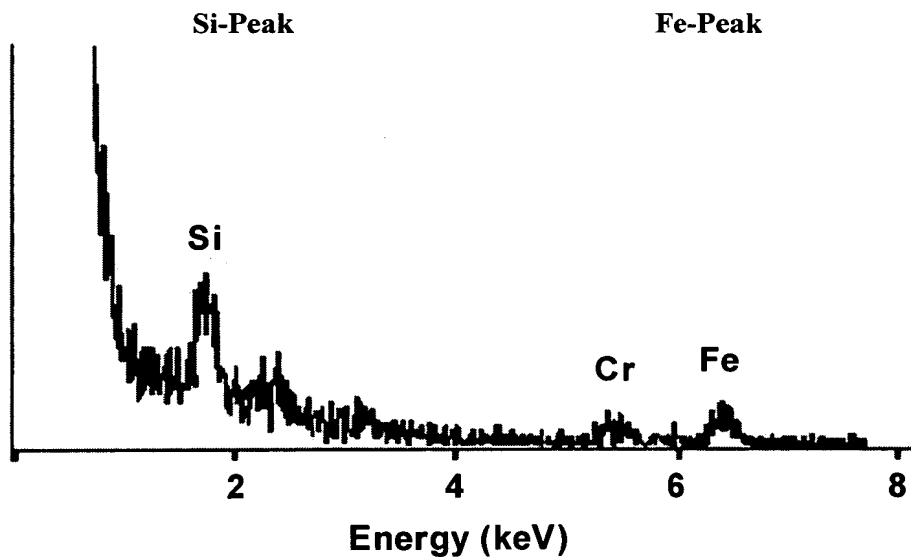


FIG. 3

A



B

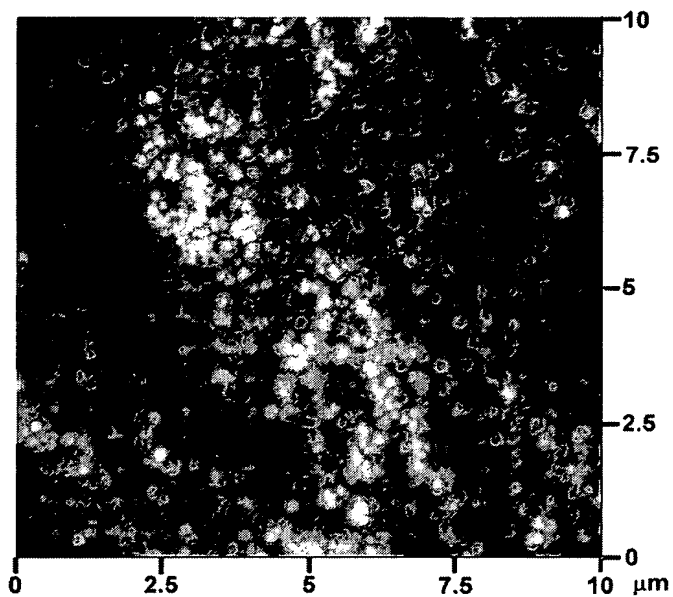


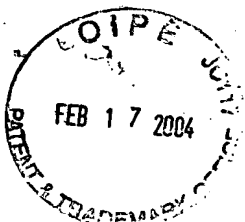
Type 316-L stainless steel surface modified with silica nano particles (A) AFM image showing the presence of stacks of nano particles and (B) EDAX spectrum of the surface confirming the presence of Silica.



Applicants: Venkatram P. SHASTRI, et al..  
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Docket No.: T1118/20071  
Sheet 4 of 8

FIG. 4





Stainless Steel

FIG. 5

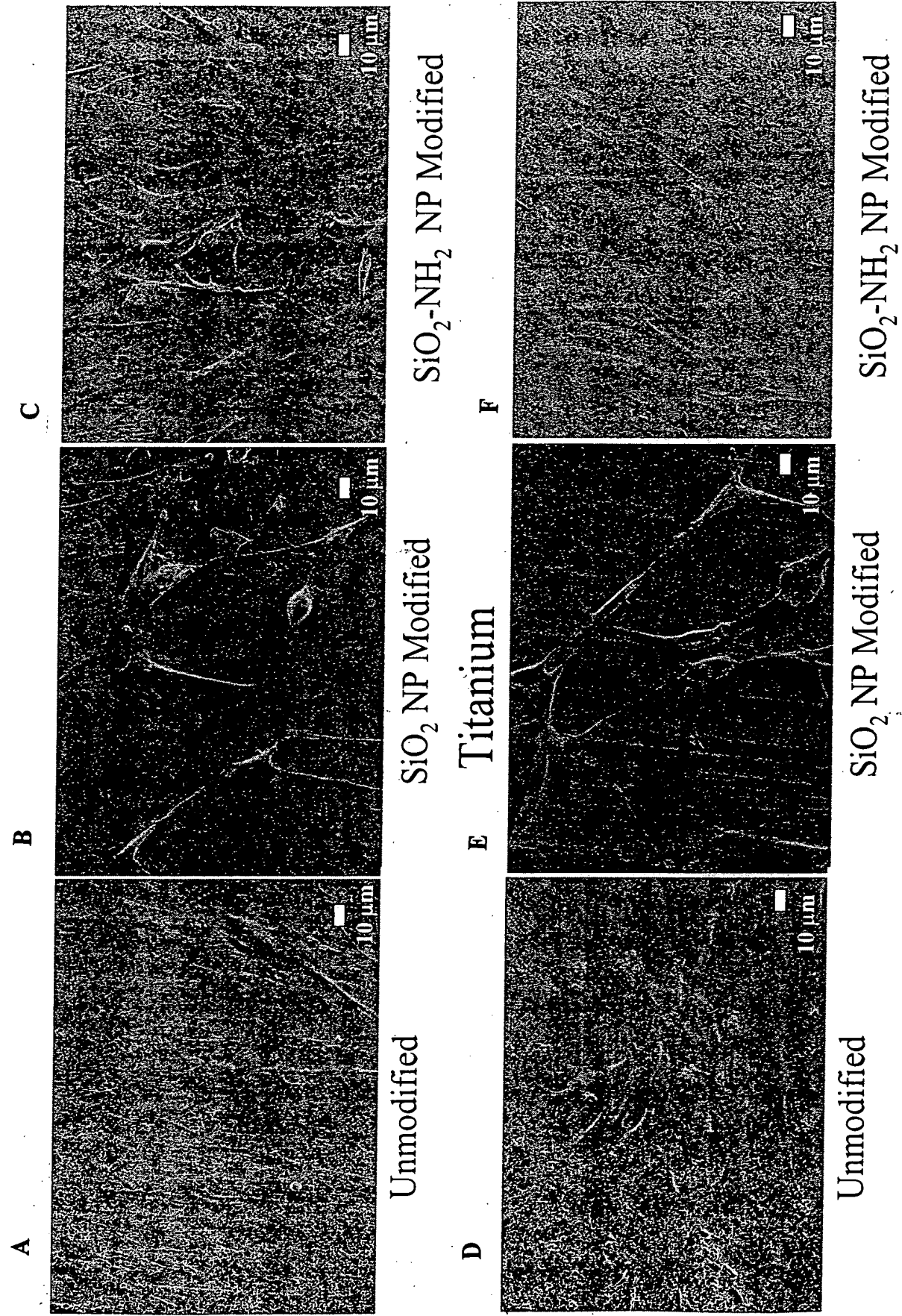




FIG.6

Functional Group Quantification on Modified Metal Surfaces

Amine Concentration on Metal Surfaces

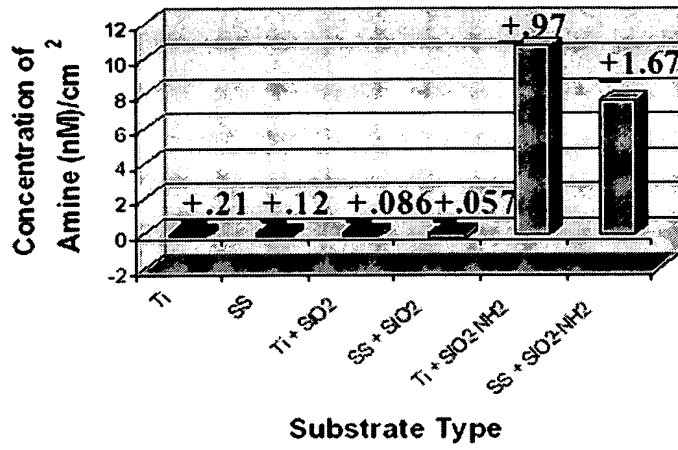
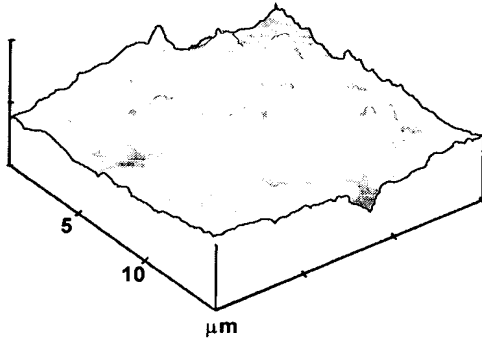


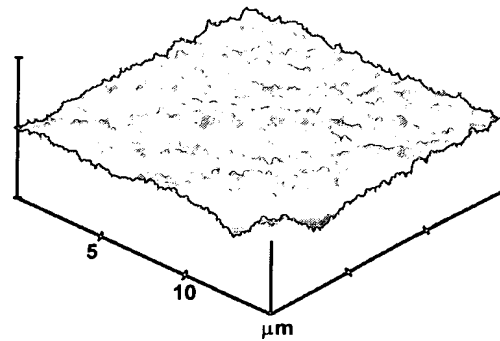


FIG. 7

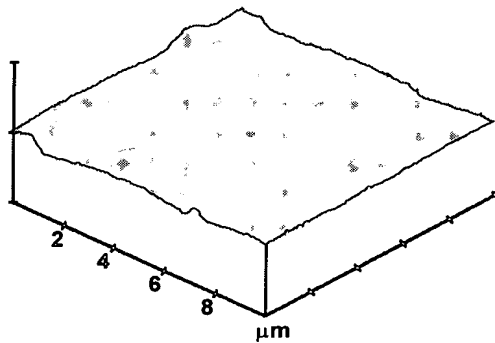
Atomic Force Microscope Images of Metal and Polymer Surfaces Modified Using Functionalized Silica Nano-particles (FSNP)



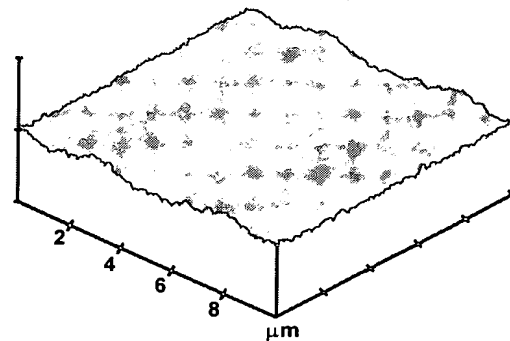
Titanium



Titanium + FSNP



Polyurethane

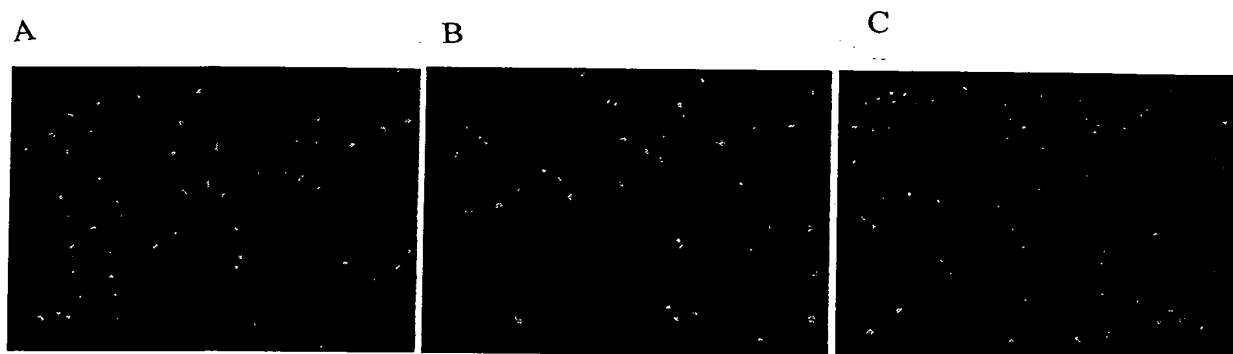


Polyurethane + FSNP



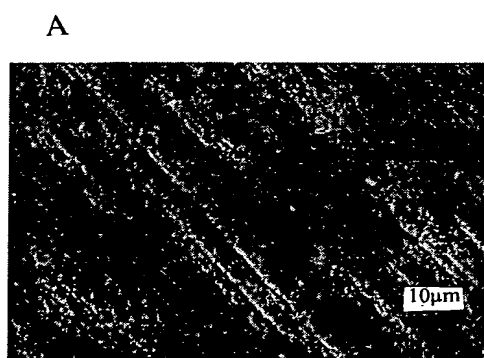


Fluorescent Images of DAPI (nuclear stain) Stained MC3T3-E1 cells on  
Polyurethane (PU) Surfaces



Polyurethane (PU)    PU + SiO<sub>2</sub> Nanoparticle    PU + FSNP

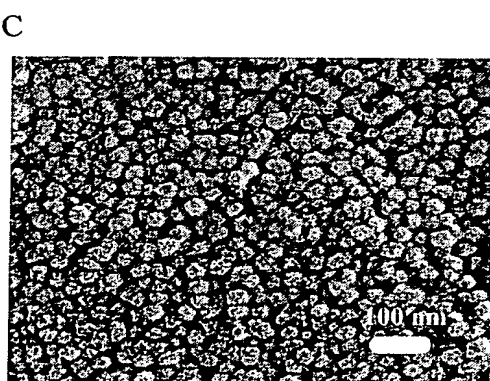
FIG. 9.    Characterization of FSNP Modified Surface Using Scanning Electron  
Microscopy. (Non-limiting example)



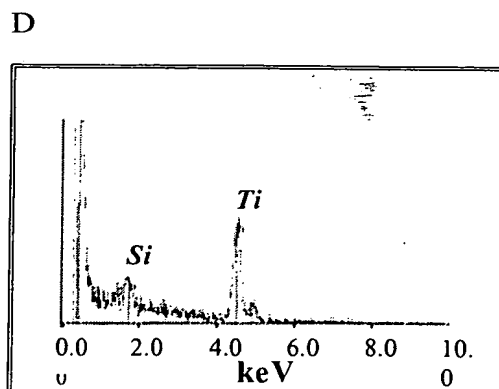
Titanium



Titanium Coated with FSNP



FSNP on Titanium Surface



EDAX Spectrum